

REMARKS

Claims 7-13 and 15-25 are pending in the application. Claims 7-13 and 15-25 are rejected. No claims are amended with this reply.

Reply to the Rejection of Claims 7-12, 21, 23 and 24 under 35 U.S.C. § 102(b)

The Examiner has rejected Claims 7-12, 21, 23 and 24 as being anticipated by U.S. Patent No. 4,960,465 to Arfaei *et al.* ("Arfaei"). Specifically, the Examiner states –

Arfaei discloses the backbone polymer based on polyoxyalkylene including polyoxyethylene, polyoxypropylene homopolymer or oxypropylene/oxyethylene copolymer. These backbone polymers are classified as polyethers. The preferred polyethers include reactive groups, e.g., amino, carboxyl, or hydroxyl groups, positioned at the end of the polymer, column 2, lines 53-58. The general formula is OH-(OR-) or H₂N-(OR-), OR OH-(OR-)OH, OR H₂N-(OR)NH₂, column 2, line 18. The polyoxyethylene having hydroxyl end groups is polyethylene glycol that is alcohol ethoxylated in applicants' claimed 24. The polyoxypropylene or oxypropylene/oxyethylene having amino functional groups is readable in applicants' claim 7. The backbone polymer in Arfaei can have both a hydrophobic moiety and an amine moiety. The backbone polymer can have the average molecule weight of from 200 to 30,000, column 2, lines 65-68. Arfaei does not name the backbone polymer such as a non-polymeric surfactant. However, the backbone polyether having terminal amino or hydroxyl group is readable in applicants' claimed hydrophobic backbone having reactive end group. The burden is on applicants to present the evidence like a declaration showing the differences with the present claims 21, 24 and 7. A grafted side chain polymer is dimethylaminoethyl methacrylate, column 4, line 17. The graft copolymer in Arfaei is readable in applicants' claims 7, 10, 15, 16, 20-24. The pH is normally adjusted to provide optimum solubility or dispersibility of the graft copolymer, column 6, lines 31-32.

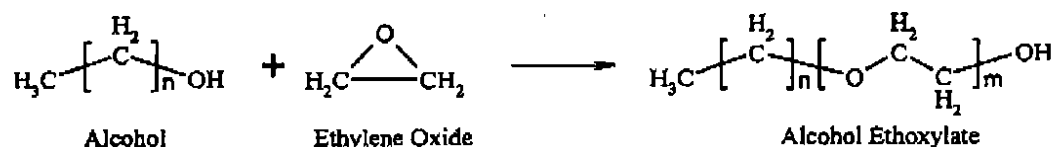
For the following reasons, Applicants respectfully traverse the Examiner's rejection of claims 7-13 and 15-25 as being anticipated by Arfaei.

Arfaei was previously discussed in Applicants' 30 May and 26 August 2003 Replies, those arguments being incorporated herein. As previously noted, Arfaei teaches graft copolymers for use as water reducing admixtures and super plasticizers for hydraulic cement concretes, mortars, grouts and the like (col. 1, lines 23-47). These graft copolymers have a polyether backbone with side chain polymers formed by polymerization of ethylenically unsaturated monomers attached to the backbone (col. 1, lines 55-58). **The polyether backbone** is any

homopolymer or copolymer capable of undergoing grafting with ethylenically unsaturated monomers and **has repeating units** $-(O-R)-$ containing the C-O ether linkage (col. 2, lines 12-17). R is an organic moiety containing a carbon atom linked to the oxygen through a single covalent bond (col. 2, lines 17-19). The polyethers can include reactive groups such as amino, carboxyl or hydroxyl groups, or their derivatives (col. 2, lines 52-57).

As shown above, every group in the polyether backbone of Arfaei must have the $-(O-R)-$ repeating unit therein. The Examiner notes that the "general formula is $OH-(OR-)$ or $H_2N-(OR-)$, or $OH-(OR-)OH$, or $H_2N-(OR)NH_2$ " (col. 2, line 18). The Examiner then states that the "polyoxyethylene having hydroxyl end groups is polyethylene glycol" (col. 2, lines 43-60) and this is the same as the alcohol ethoxylate in claim 24. Applicants respectfully disagree.

Alcohol ethoxylate is so named because it is formed by the ethoxylation of a fatty acid as shown below –



As seen above, the repeating unit is the $\text{CH}_3-(\text{CH}_2)_n-$ portion of the polymer. This repeating unit of the backbone clearly does not have the $-(O-R)-$ repeating unit required in the backbone of Arfaei. Accordingly, the Examiner's statement that the polyoxyethylene having hydroxyl end groups is the same as the alcohol ethoxylated of claim 4 is incorrect. Furthermore, the amine groups in Arfaei are in the backbone. In contrast, the amine groups in the present invention are in the grafted part or the side chain of the molecule.

The hydrophobic backbone of the present invention does not have the polyether $-(O-R)-$ repeating unit as taught by Arfaei. Accordingly, as Arfaei does not teach or suggest each and every element of the presently claimed invention, and actually teaches a different polymer backbone and therefore a different graft copolymer, Arfaei cannot be said to render the presently claimed invention obvious.

For at least all of the above reasons, it is seen that Arfaei does not teach or suggest the graft copolymers of the present invention. It is believed that these remarks overcome the Examiner's rejection of claims 7-12, 21, 23 and 24 as being anticipated by Arfaei under 35 U.S.C. § 102(b). Withdrawal of the rejection is respectfully requested.

Reply to the Rejection of Claims 7-13 and 15-25 under 35 U.S.C. § 103(a)

The Examiner has rejected Claims 7-13 and 15-25 as being unpatentable over Arfaei or U.S. Patent No. 6,291,595 to Rodrigues ("Rodrigues"). Specifically, the Examiner states –

The difference between the present claims and Arfaei is the requirement in the present claim 21 for the selected backbone polymer under Markush group. The polyether having hydroxyl or amine terminal group is readable in applicants' claimed non-polymeric surfactant. It would have been obvious to one of ordinary skill in the art to use a graft copolymer in Arfaei such that the backbone and grafted side chain have both a hydrophobic moiety and an amine moiety and hydroxyl moiety, the ratio of the said amine to said hydrophobe can be selected as specified in the present claims 10-12 because the selected ratio is depending on the desired properties of the obtained graft copolymer and wherein a pH can be controlled for obtaining the desired solubility of the graft copolymer.

Rodrigues discloses a graft copolymer comprising polyglycol having a hydroxyl or amine terminal group having the general formula at column 4, line 27, and an ethylenically unsaturated monomer grafted on said polyglycol in the presence of a free radical initiator, column 1, lines 55-64. The polyglycol such as an alcohol ethoxylated is readable in applicants' claim 24. The ethylenically unsaturated monomer can be selected such as acrylamide, vinyl pyrrolidone, column 3, lines 56-65. It would have obvious to one of ordinary skill in the art to select the polyglycol in Rodrigues invention such that a said polyglycol have both a hydrophobic moiety and functional group such as hydroxyl or amine because the selection of a functionalized polyglycol is depending on the desired solubility of the obtained graft copolymer and the pH condition is controlled by the alkaline medium.

For the following reasons, Applicants respectfully traverse the Examiner's rejection of claims 7-13 and 15-25 as being unpatentable over Arfaei or Rodrigues.

Arfaei was discussed above, those arguments being incorporated herein. As noted above, the graft copolymer of Arfaei requires a polyether backbone having an —(O-R)- repeating unit. This requirement for the graft copolymer of Arfaei is not found in the backbone of the graft copolymer of the present invention. Accordingly, as this repeating unit is required in the polymer of Arfaei, Arfaei provides no motivation to one skilled in the art to produce graft copolymers without this repeating unit, such as the graft copolymers of the present invention. For at least these reasons, Arfaei does not render the presently claimed graft copolymer obvious.

Referring to Rodrigues therein is disclosed textile sizes containing anhydride based graft copolymers. Rodrigues is like Arfaei in that it comprises a polyglycol backbone having an —(O-R)- repeating unit (col. 4, lines 25-35). As previously stated, this required repeating unit is not

found in the backbone of the present invention. Accordingly, as this repeating unit is required in the polymer of Rodrigues, Rodrigues provides no motivation to one skilled in the art to produce graft copolymers without this repeating unit, such as the graft copolymers of the present invention. For at least these reasons, Rodrigues does not render the presently claimed graft copolymer obvious.

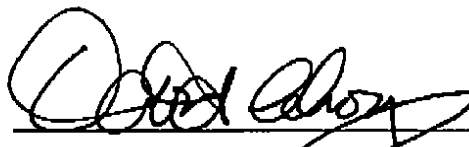
For at least all of the above reasons, it is seen that neither Arfaei nor Rodrigues teach or suggest the graft copolymers of the present invention. It is believed that these remarks overcome the Examiner's rejection of claims 7-13 and 15-25 as being unpatentable over Arfaei or Rodrigues under 35 U.S.C. § 103(a). Withdrawal of the rejection is respectfully requested.

Based on the above amendments and remarks, allowance of the claims is believed to be in order, and such allowance is respectfully requested.

Respectfully submitted,

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